ECOSYSTEM STATUS INDICATORS
Physical Environment

GULF OF ALASKA

Ocean transport in the western Gulf of Alaska –FOCI
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The spring and summer seasonal strength of the Alaskan Stream and Alaska Coastal Current (ACC) is an important factor for overall productivity on the shelf of the Gulf of Alaska. FOCI uses satellite-tracked drift buoys, drogued at mid mixed-layer depths (~45 m), to measure ocean currents as a function of time and space. Animations of drifter trajectories from deployments during 2001-2003 can be found at *http://www.pmel.noaa.gov/steller/ssl_drifters.shtml*. There is a strong seasonal signal in the ACC. During late spring and summer, the flow on the Gulf of Alaska shelf between Prince William Sound and the Shumigan Islands is weak. The many bathymetric features such as troughs and banks interact with the currents. This results in flow up the eastern side of such troughs as Amatouli, Chiniak and Barnabas. Flow over banks such as Portlock, is often recirculating, and satellite-tracked drifters can be retained in closed circulation for weeks to months. ACC flow in the western Gulf of Alaska during 2001 and 2002 was particularly weak. Later in the summer or fall, with the intensification of regional winds, the ACC becomes stronger, and the flow down Shelikof Strait becomes more organized, as shown by the animations for September of 2001 and 2002. During 2003 (Figure 14), ACC flow was more organized and stronger. Specifically, the flow in Shelikof Strait appeared more complex with more meanders and eddies than have been evident in previous years. This year, more than the typical number of drifters went aground along the

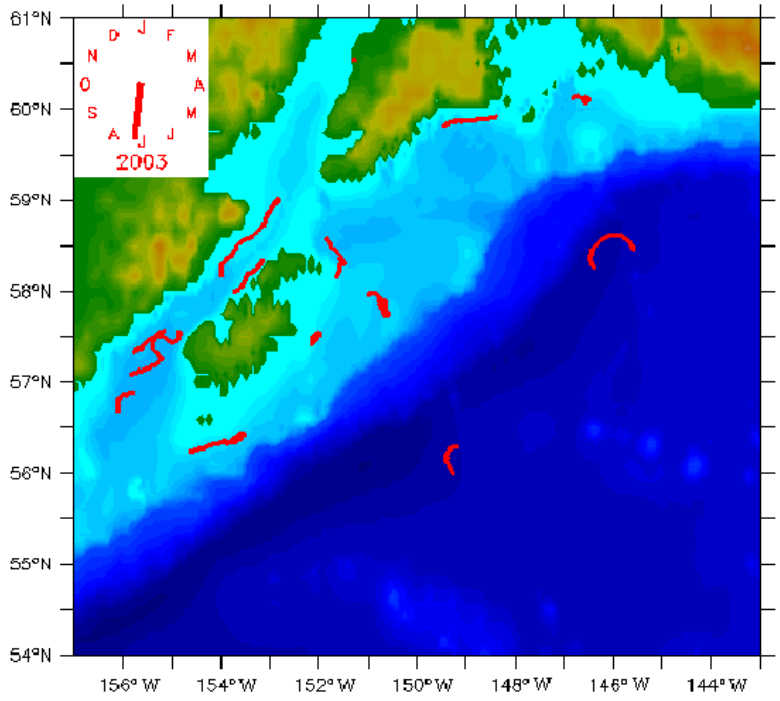

Figure 14. Tracks of satellite-tracked drifters for the period October 14-18, 2001, show sluggish flow on the shelf, except for within Shelikof Strait.

Cross-shelf fluxes are important to providing nutrients to the shelf. Each year (2001-2003) brought flow onto the shelf in the vicinity of the Seward Line, which extends south southeastward from the mouth of Resurrection Bay across the shelf and over the basin. The presence of an eddy is clearly evident from drift trajectories over the basin. Such eddies interact with the shelf, often drawing water off the shelf and into the basin, and are discussed in more detail in the next section. From the head of the gulf to Amchitka Pass, the Alaskan Stream appeared to be fairly typical during 2003, through July, with low eddy kinetic energy and relatively high velocity (>50 cm s^{-1} to the southwest). By next year, there will be enough data to allow construction of an annual Gulf of Alaska transport index that can be compared with climate indices such as PDO, AO, etc.